

Small mammals are ecological giants in local grasslands

Despise or adore them, local burrowing mammals are receiving more attention as "big players" for their contribution to the overall well-being of California's ecological communities.

Ecological communities are defined as a group of interacting species living in the same place. A community is linked by the network of influences that species have on one another, great or small. One species may affect another one or numerous others in its ecological role. This concept has become popularized by the term, "the balance of nature," and speaks to the complexity of levels of interaction that are occurring in any given community at any given time.

Common yet a keystone species

California ground squirrels (*Spermophilus beecheyi*) are being investigated as a "keystone species" for the California prairie ecosystem. This is a species whose presence or absence, or significant increase or decrease in population size, profoundly affects other species' survivability in that habitat. Recognition of this ecological standing is usually derived from the results of studies in which the species is added or removed from the community.

The term "keystone species" comes from the center stone in a Roman arch that supports the majority of the structure's weight. Removal of this keystone causes the entire form to collapse. In this way, removal of a keystone species can lead to the local extirpation of many species and negative effects on the overall health of the ecosystem.

Why are ground squirrels of heightened interest to ecologists? More than 200 other wildlife species have been sighted using ground squirrel colonies. Some species prey upon ground squirrels while others use their burrows for shelter. In Central California, common wildlife visitors to areas of ground squirrel occupation include red-tailed hawks, coyotes, golden eagles, northern Pacific rattlesnakes, and burrowing owls. Also, a long list of insects and plant species

are associated with the colony's construction area.

Additionally, squirrel feeding activities result in a tilling or churning of the soil, enhancing its ability to support plants. A greater vegetative diversity – with nitrogen-rich mixtures of grasses and forbs – offers sustenance to other animals. This enriched habitat attracts a wide array of grazers and browsers that wish to utilize these food resources. Ecologically heralded as the food web hierarchy, this diverse association of plants and wildlife is dependent on the squirrel's presence for life.

American badgers

Another subterranean species that is gaining notoriety as an ecosystem giant in the California's grassland prairie is the American badger (*Taxidea taxus*). Although not receiving the accolades of the keystone species, the badger is a close runner-up as an "ecosystem engineer." This term denotes an organism that creates or modifies the physical environment in a significant way over time. Beavers (*Castor canadensis*) are the stereotypical ecosystem engineer because of the effects their dams have on stream flow, geomorphology, and the surrounding ecology and life forms that use the region.

Badgers also do their share of native engineering by modifying the landscape and soil nutritive richness. By loosening and aerating the soil, they speed up the decomposition of vegetation, enhancing nutrient availability. During wildland fires, these soils can serve as firebreaks for down-hole escapees. Since badgers were part of the ecological setting before humans, they may ultimately be connected to the presence and restoration of native plant species and their seed banks. The large soil excavation mounds at the



RON ARGANBRIGHT/MMED

entrance of badger dens result in the mixing of nutrients and soil conditions as deep soil is brought to the surface. Badger burrows can act as homesteads to other wildlife species including rabbits, salamanders, frogs, snakes and long-tailed weasels, especially during the hot summer months. Badgers have been known to work "collaboratively" with hawks and coyotes to raid pocket gopher and squirrel holes (see inset photo).

Regardless of the colorful scientific moniker used to identify these species and their ecological roles, current research suggests that these two California underground inhabitants play a bigger role in shaping the natural environment than was previously believed.

LLNL's wild side

By Jim Woollett



JIM WOOLLETT/EPD

Badgers (left and below) are prairie ecosystem engineers. The ground squirrel (above) also plays an important role in the food web hierarchy.



Security Department to close Avenue B security post today

The Lab's Security Department has announced that security post 3B, on the north side of the intersection of Avenue B and Third Street, will close permanently beginning 6 p.m. today (March 3) —except for Fire Department emergency vehicle traffic. The closure is one of several cost-driven service reductions needed to meet the department's FY 2006 budget reductions.

Within approximately one block of pPost 3B, three alternate access points for use by pedestrians and bicyclists who must travel northbound or southbound in that area. The access booths are long enough to accommodate a bicycle and rider who has dismounted.

Adjacent to each booth is either an electronic or manual turnstile for pedestrian access only. The electronic turnstile

allows passage in either direction; the manual turnstile permits passage only from the Limited Area (LA) to the Property Protection Area (PPA). Employees who encounter problems with either the electronic access booths or turnstiles should call the PFD Alarms Console at 2-7222 to report malfunctions.

The post 3B closure means that approved motor vehicles must use an alternate entry point when traveling between the LA and PPA. Alternate vehicle entry/exit points are security post 1D, at the east end of First Street, north of Bldg. 316; and post west gate (P-WG), at the west end of First Street, north-west of Bldg. 111. Post 1D is open all hours every day. P-WG is open 6:30 a.m.-6:30 p.m., Monday-Friday, and closed on weekends and holidays.